

AMENDMENTS TO THE CLAIMS:

This listing of the claims replaces all prior versions and listing of the claims in the present application.

Listing of Claims:

1. (previously presented) An asynchronous transfer mode (ATM) exchange, comprising:

an ATM switch;

(a) a next hop information adder; and

(b) a shared medium frame generator, separate from and connected to said next hop information adder by said ATM switch, said next hop information adder including:

(a1) a first unit which converts an ATM cell including connection data, into a network layer packet;

(a2) a second unit which extracts a network layer next hop out of said network layer packet;

(a3) a third unit which converts said network layer next hop into associated connection data; and

(a4) a fourth unit which receives said network layer packet from said second unit and said connection data from said third unit, and converts the thus received network layer packet and connection data into a first ATM cell and transmits said first ATM cell to said ATM switch,

said shared medium frame generator including:

(b1) a first unit that receives said first ATM cell from said ATM switch which converts said first ATM cell into a network layer packet and extracts said connection data out of said first ATM cell;

(b2) a sixth unit which receives said connection data from said fifth unit and converts the thus received connection data into a shared medium address; and

(b3) a seventh unit which receives said network layer packet from said fifth unit and said shared medium address from said sixth unit, and converts the thus received network layer packet and shared medium address into a shared medium frame.

2. (original) The asynchronous transfer mode (ATM) exchange as set forth in claim 1, wherein a relation between said network layer next hop and said connection data is defined by address resolution protocol (ARP).

3. (original) The asynchronous transfer mode (ATM) exchange as set forth in claim 1, wherein a relation between said connection data and said shared medium address is defined by address resolution protocol (ARP).

4. (original) The asynchronous transfer mode (ATM) exchange as set forth in claim 1, wherein said third unit converts said network layer next hop said associated connection data in accordance with a predetermined rule.

5. (original) The asynchronous transfer mode (ATM) exchange as set forth in claim 1, wherein a communication between

said third unit and said sixth unit is made through an internal connection identifier.

6. (previously presented) An asynchronous transfer mode (ATM) exchange comprising:

(a) an asynchronous transfer mode (ATM) switch;

(b) a server card receiving an ATM cell including connection data, from said asynchronous transfer (ATM) mode switch;

(c) an Ethernet line card, separate from and connected to said server card through said ATM switch, said Ethernet line card receiving an ATM cell including connection data, from said asynchronous transfer (ATM) mode switch, and connecting to an Ethernet terminal directly or through an Ethernet router; and

(d) an asynchronous transfer mode line card receiving an ATM cell from said asynchronous transfer (ATM) mode switch, and connecting to an asynchronous transfer mode terminal directly or through an asynchronous transfer mode router,

said server card including:

(b1) a first unit which converts said ATM cell received from said ATM switch into a network layer packet;

(b2) a second unit which extracts a network layer next hop out of said network layer packet;

(b3) a third unit which converts said network layer next hop into associated connection data; and

(b4) a fourth unit which receives said network layer packet from said second unit and said connection data from said third unit, and converts the thus received network layer packet and connection data into a first ATM cell and transmits said first ATM cell to said ATM switch,

said Ethernet line card including:

(c1) a fifth unit which converts said first ATM cell received from said ATM switch into a network layer packet and extracts said connection data out of said first ATM cell;

(c2) a sixth unit which receives said connection data from said fifth unit and converts the thus received connection data into a shared medium address, and

(c3) a seventh unit which receives said network layer packet from said fifth unit and said shared medium address from said sixth unit, and converts the thus received network layer packet and shared medium address into a shared medium frame.

7. (original) The asynchronous transfer mode (ATM) exchange as set forth in claim 6, wherein a relation between said network layer next hop and said connection data is defined by address resolution protocol (ARP).

8. (original) The asynchronous transfer mode (ATM) exchange as set forth in claim 6, wherein a relation between said connection data and said shared medium address is defined by address resolution protocol (ARP).

9. (original) The asynchronous transfer mode (ATM) exchange as set forth in claim 6, wherein said third unit converts said network layer next hop said associated connection data in accordance with a predetermined rule.

10. (original) The asynchronous transfer mode (ATM) exchange as set forth in claim 6, wherein a communication between said third unit and said sixth unit is made through an internal connection identifier.

11. (currently amended) A method of operating an asynchronous transfer mode (ATM) exchange, comprising the steps of:

- (a) converting an ATM cell including connection data, into a network layer packet;
- (b) extracting a network layer next hop out of said network layer packet;
- (c) converting said network layer next hop into associated connection data;
- (d) converting said network layer packet and said associated connection data into a first ATM cell,
- (e) transferring said first ATM cell through an ATM switch;
- (f) converting said first ATM cell into a network layer packet;
- (g) extracting connection data out of said first ATM cell;

(h) converting said connection data into a shared medium address, [[and]]

(i) converting said network layer packet and said shared medium address into a shared medium frame,

said steps (a) to (d) being to be carried out independently of said steps (f) to (i), and

identifying a relation between said network layer next hop and said connection data by address resolution protocol (ARP).

12. (previously presented) The method as set forth in claim 11, wherein said steps (f) and (g) are concurrently carried out.

13. (canceled)

14. (original) The method as set forth in claim 11, further comprising the step of identifying a relation between said connection data and said shared medium address by address resolution protocol (ARP).

15. (original) The method as set forth in claim 11, wherein said step (c) is carried out in accordance with a predetermined rule.

16. (previously presented) A recording medium readable by a computer, storing a program therein for causing a computer to act as an asynchronous transfer mode (ATM) exchange, said asynchronous transfer mode (ATM) exchange comprising:

an ATM switch;

(a) a next hop information adder; and

(b) a shared medium frame generator, separate from and connected to said next hop information adder by said ATM switch, said next hop information adder including:

(a1) a first unit which converts an ATM cell including connection data, into a network layer packet;

(a2) a second unit which extracts a network layer next hop out of said network layer packet;

(a3) a third unit which converts said network layer next hop into associated connection data; and

(a4) a fourth unit which receives said network layer packet from said second unit and said connection data from said third unit, and converts the thus received network layer packet and connection data into a first ATM cell and transmits said first ATM cell to said ATM switch,

said shared medium frame generator including:

(b1) a fifth unit that receives said first ATM cell from said ATM switch which converts said first ATM cell into a network layer packet and extracts said connection data out of said first ATM cell;

(b2) a sixth unit which receives said connection data from said fifth unit and converts the thus received connection data into a shared medium address, and

(b3) a seventh unit which receives said network layer packet from said fifth unit and said shared medium address from

said sixth unit, and converts the thus received network layer packet and shared medium address into a shared medium frame.

17. (original) The recording medium as set forth in claim 16, wherein a relation between said network layer next hop and said connection data is defined by address resolution protocol (ARP).

18. (original) The recording medium as set forth in claim 16, wherein a relation between said connection data and said shared medium address is defined by address resolution protocol (ARP).

19. (previously presented) The recording medium as set forth in claim 16, wherein said third unit converts said network layer next hop said associated connection data in accordance with a predetermined rule.

20. (previously presented) The recording medium as set forth in claim 16, wherein a communication between said third unit and said sixth unit is made through an internal connection identifier.

21. (currently amended) A recording medium readable by a computer, storing a program therein for causing a computer to carry out a method of operating an asynchronous transfer mode (ATM) exchange, said method comprising the steps of:

(a) converting an ATM cell including connection data, into a network layer packet;



(b) extracting a network layer next hop out of said network layer packet;

(c) converting said network layer next hop into associated connection data;

(d) converting said network layer packet and said associated connection data into a first ATM cell,

(e) transferring said first ATM cell through an ATM switch;

(f) converting said first ATM cell into a network layer packet;

(g) extracting connection data out of said first ATM cell;

(h) converting said connection data into a shared medium address, [[and]]

(i) converting said network layer packet and said shared medium address into a shared medium frame,

said steps (a) to (d) being to be carried out independently of said steps (f) to (i), and

identifying a relation between said network layer next hop and said connection data by address resolution protocol (ARP).

22. (previously presented) The recording medium as set forth in claim 21, wherein said steps (f) and (g) are concurrently carried out.

23. (canceled)

24. (original) The recording medium as set forth in claim 21, wherein said method further includes the step of identifying a relation between said connection data and said shared medium address by address resolution protocol (ARP).

25. (original) The recording medium as set forth in claim 21, wherein said step (c) is carried out in accordance with a predetermined rule.